

# Cannabis Impairment Assessment

## EYES

**Conjunctiva Tissue** (looks like pink eye in both eyes), **Lack of Convergence, Dilated Pupils, & No HGN** (when cannabis alone).

## MUSCLES

**Tremors** Observed in extremities, upper torso, & eyelids (closed eyes).

## ODOR

**Smell** Burnt marijuana, additive flavor for vaping, & maybe for edibles.

## OBSERVATIONS

**Indica:** Produces a 'stoned' feeling. Physically & mentally relaxing. Centered on the body. Enhances sensations of taste, touch, & sound. Euphoria & relaxed inhibitions.

**Sativa:** Produces the 'high' feeling (energetic). Less overpowering than the Indica 'stone.' Less likely to produce drowsiness. High described as: cerebral, energetic, creative, giggly & or psychedelic.

**Psycho-Physical Tests:** Generally slow performance; muscle tremors, especially in legs & arms.

**Information processing:** Likely diminished. Impaired memory & comprehension. Jumbled thought formation & lack of concentration. Likened to attention deficit disorder, cognitive impairment. Altered

distance perception.

**Modified Romberg:** Distorted internal clock. Eyelid Tremors.

**Mood Changes:** Including panic & paranoia.

**Mouth:** Flecks of Green Vegetable Matter (GVM - marijuana) in teeth. Possible green or white coating on tongue.

## IMPORTANT STUDIES TO KNOW

- National Highway Traffic Safety Administration, *Drug and Alcohol Crash Risk*, (Report No. DOT HS 812 117) Washington DC: U.S. Government Printing Office (2015). *Often cited by defense- Virginia Beach Study*
- Hartman, R.L., Huestis, M.A., et al., *Cannabis Effects on Driving Lateral Control With and Without Alcohol*, **\*MUST KNOW\*** Drug and Alcohol Dependence, <http://dx.doi.org/10.1016/j.drugalcdep.2015.06.015> (2015).
- \* Huestis, M.A., et al., *Estimating the Time of Last Cannabis Use from Plasma  $\Delta^9$ -Tetrahydrocannabinol and 11-nor-Carboxy- $\Delta^9$ -Tetrahydrocannabinol Concentrations*, Clinical Chemistry, 51(12), 2289-2295, doi:10.1373/clinchem.2005.056838 (2005).
- \* Hiroven, J., Huestis, M.A., et al., *Reversible and Regionally Selective Downregulation of Brain Cannabinoid CB 1 Receptors in Chronic Daily Cannabis Smokers*, Molecular Psychiatry, 59(3), 642-649, doi:10.1038/mp.2011.82 (2012).
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- Hartman, R.L., Huestis, M.A., et al., *Effect of Blood Collection Time on Measured  $\Delta^9$ -Tetrahydrocannabinol Concentrations: Implications for Driving Interpretation and Drug Policy*, Clinical Chemistry, 62:2, 367-377, doi:10.1373/clinchem.2015.248492 (2016).
- Hartman, R.L., Huestis, M.A., et al., *Controlled Cannabis Vaporizer Administration: Blood and Plasma Cannabinoids With and Without Alcohol*, Clinical Chemistry, 61(6), 850-869, doi:10.1373/clinchem.2015.238287(2015).
- Bergamaschi, M., Hiroven, J., Huestis, M.A., et al., *Impact of Prolonged Cannabinoid Excretion in Chronic Daily Cannabis Smokers' Blood on Per Se Drugged Driving Laws*, Clinical Chemistry, 59(3), 519-526, doi:10.1373/clinchem.2012.195503 (2013).
- Desrosiers, N., Huestis, M.A., et al., *Phase I and II Cannabinoid Disposition in Blood and Plasma of Occasional and Frequent Smokers Following Controlled Smoked Cannabis*, Clinical Chemistry, 60(4), doi:10.1373/clinchem.2013.216507 (2014).
- DRUID, *Analytical Evaluation of Oral Fluid Screening Devices and Preceding Selection Procedures*, (Project No. TREN-05-FP6TR-S07.61320-518404) Finland (2010).
- Grotenhermen, F., Drummer, O.H., Ramaekers, J.G., et al., *Developing Limits for Driving Under Cannabis*, Addiction, 102, 1910-1917, doi:10.1111/j.1360-0443.2007.02009.x (2007).
- Grotenhermen, F., Ramaekers, J.G., et al., *Developing Science-Based Per Se Limits for Driving Under the Influence of Cannabis (DUI): Findings and Recommendations by an Expert Panel*, DUI Report (2005).
- Papafotiou, K., et al., *An Evaluation of the Sensitivity of the Standardized Field Sobriety Tests (SFSTs) to Detect Impairment Due to Marijuana Intoxication*, Psychopharmacology, 180, 107-114, doi:10.1007/s00213-004-2119-9 (2005).
- Hartman, R.L., & Huestis, M.A., *Cannabis Effects on Driving Skills*, Clinical Chemistry, 59(3), 478-492, <http://dx.doi.org/10.1373/clinchem.2012.194381> (2013).
- Hartman, R.L., Huestis, M.A., et al., *Drug Recognition Expert (DRE) Examination Characteristics of Cannabis Impairment*, Accident Analysis & Prevention, 92, 219-229, <http://dx.doi.org/10.1016/j.aap.2016.04.012> (2016).

**Smoked: Impairment Peak:** 0-30 mins

**High Experience:** 1-3 hours

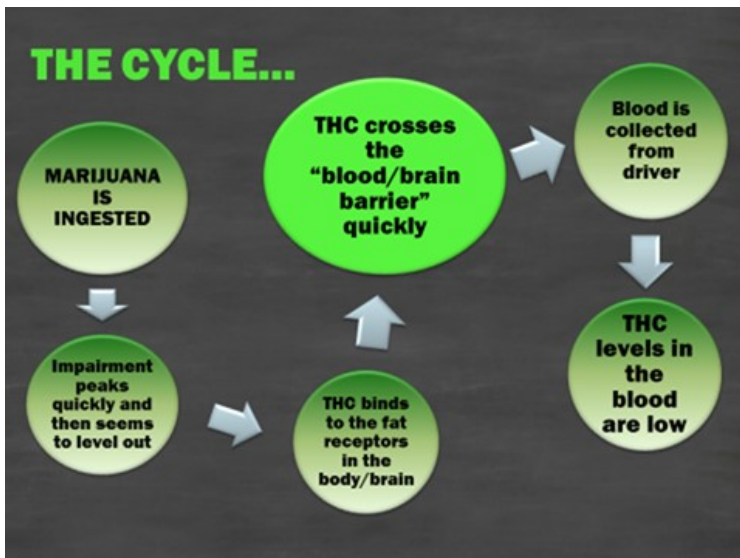
Impairment may last up to 24 hours, without awareness effects.

**Oral/ Edible: Impairment Peak:** 1-3 hours

**High Experience:** 4-8 hours

Residual effects depend on dose.

**GET. BLOOD. FAST.**



"The Cycle" created by Courtney Popp, WA TSRP

**Delta-9-THC** - The main psychoactive substance found in marijuana.

AKA: delta-9-tetrahydrocannabinol ( $\Delta^9$ -THC), dronabinol

**11- Hydroxy-THC** - The main psychoactive metabolite of THC formed in the body after marijuana consumption. AKA: Hydroxy THC, 11-Hydroxy- $\Delta^9$ -tetrahydrocannabinol (11-Hydroxy- $\Delta^9$ -THC), 11-OH-THC

Delta-9 + Hydroxy = Impairment

**11- nor-9- Carboxy-THC** - The main secondary metabolite of THC formed after marijuana is consumed. It is NOT active, but indicates historical use. AKA: THC-COOH (most often seen this way), Carboxy THC, 11-nor-9-carboxy-delta-9-tetrahydrocannabinol (11-nor-9-carboxy- $\Delta^9$ -THC), 11-COOH-THC

**Cannabinoids** - Group of active compounds found in marijuana.

**Cannabidiol (CBD)** - Non-psychoactive (a/k/a not impairing) cannabinoid. Found in medical strains.

**Cannabinol (CBN)** - THC metabolite (10% as psychoactive as THC), which may show recent or heavy use.

**Chronic vs. Occasional** - Terms denoting frequency of use.

**Chronic** - Continuing for a long time or recurring frequently.

**Occasional** - Happening infrequently and irregularly.

**Psychoactive or Active** - Causes euphoric and impairing effects (THC and 11-OH-THC).

**Not active or inactive** - Does NOT cause euphoric or impairing effects (THC-COOH).

**Compensation** - Behavior that develops either consciously or unconsciously to offset a deficiency.

**Critical Tracking** - A set of tasks used to determine impairment in a clinical setting.

**Epidemiological** - Is the study and analysis of the patterns, causes, and effects of health and disease conditions in defined populations.

**Lateral Control** - Control of side- to-side or sideways movement.

**Limit of Detection (LOD)** - Lowest quantity of a drug that can be distinguished from the absence of that drug.

**Limit of Quantitation (LOQ)** - Lowest amount of a drug in a sample that can be quantitatively determined.

**Measurement of Uncertainty** - Best estimate of how far a quantity might be from "true value." If two people measure one cup of flour, the amount will

always be different even if it's not noticeable to the naked eye.

**Metabolite** - A chemical created in the body as part of the process of breaking down the parent compound (e.g. 11-OH-THC and THC-COOH).

**Parent compound or parent drug** - The drug in the original form that it is ingested (e.g. THC).

**Per Se Law** - Statutory assignment of a blood concentration above which is an offense to drive.

**Permissible Inference** - A legally specified fact that the fact finder may infer.

**Pharmacokinetics** - The movement of a drug into, through & out of the body - the time course of its absorption.

**Plasma vs. Whole Blood**

**Plasma** - The colorless fluid part of blood, lymph, or milk, in which corpuscles or fat globules are suspended.

**Whole Blood** - Blood drawn directly from the body from which none of the components (such as plasma or platelets) have been removed.

**Titrate** - Continuously measure & adjust the balance of [a substance].

**Tolerance** - The capacity of the body to endure or become less responsive to a substance.

**Zero-order Elimination Kinetics** - The rate of elimination is constant and does not depend on the initial drug concentration.

### INTERNET RESOURCES

[www.wsp.wa.gov/breathtest/dredocs.php](http://www.wsp.wa.gov/breathtest/dredocs.php) (NHTSA/IACP Manuals)

[www.ndaajustice.org/ntlc\\_home.html](http://www.ndaajustice.org/ntlc_home.html) (Nat'l Traffic Law Center)

[www.nih.gov/research-training](http://www.nih.gov/research-training) (Research)

[www.decp.org](http://www.decp.org) (Int'l Drug Eval. & Classification Program)

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